

# UNITED STATES SIGNAL SERVICE

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### INTRODUCTION.

This REVIEW is based on reports for September, 1890, from 2,387 regular and voluntary observers. These reports are classified as follows: 168 reports from Signal Service stations; 118 reports from United States Army post surgeons; 6 reports of rainfall observations of the United States Geological Survey in Arizona and New Mexico; 1,544 monthly reports from state weather service and voluntary observers; 31 reports from Canadian stations; 166 reports through the Central Pacific Railway Company; 354 marine reports through the co-operation of the Hydrographic Office, Navy Department; marine

reports through the "New York Herald Weather Service;" monthly weather reports from the local weather services of Alabama, Arkansas, Colorado, Illinois, Indiana, Iowa Weather and Crop Service, Kansas, Kentucky, Louisiana, Michigan, Minnesota, Mississippi, Missouri, Meteorological Report of the Missouri State Board of Agriculture, Nebraska, New England, New Jersey, New York, North Carolina, North and South Dakota, Ohio, Oregon, Pennsylvania, South Carolina, Tennessee, and Texas, and international simultaneous observations. Trustworthy newspaper extracts and special reports have also been used.

### CHARACTERISTICS OF THE WEATHER FOR SEPTEMBER, 1890.

The month was cooler than the average September in all districts east of the Rocky Mountains, save in eastern Maine, the Canadian Maritime Provinces, southern Virginia, North Carolina, at Jacksonville, Fla., and Rio Grande City, Tex. The month was cooler than usual west of the Rocky Mountains, except along the Pacific coast between the 35th and 43d parallels and north of the 46th parallel. The greatest departures below the average temperature were noted from eastern Kansas and Indian Territory to the west part of the lower lake region, where they exceeded 4°, and the most marked departures above the average temperature occurred in the Canadian Maritime Provinces, North Carolina, and Arizona, where they were more than 2°. At stations in the middle Mississippi and Red River valleys, and at Key West, Fla., the month was the coldest, and at Fort Apache, Ariz., it was the warmest September on record. The highest temperature reported by a regular station of the Signal Service was 110° at Yuma, Ariz., and by a voluntary observer, 122°, at Volcano Springs, Cal. The lowest temperature reported by a regular station of the Signal Service was 24° at Fort Washakie, Wyo., and by a voluntary observer, 7°, at Climax, Colo. At Key West and Pensacola, Fla., New Orleans, La., in southeast Texas, at Oswego, N. Y., Springfield, Ill., Valentine, Nebr., Huron, S. Dak., Fort Custer and Helena, Mont., Fort Elliott, Tex., Keeler, Cal., and Tatoosh Island, Wash., the minimum temperature was as low or lower than previously reported for September. Compared with the average date of first killing frost the killing frost of the 8th in western Colorado, of the 24th in northern New Jersey, of the 25th in southeast Pennsylvania, and of the 28th in central Missouri was about one week early; that of the 1st in northeastern Pennsylvania, and of the 13th generally in Kansas was about three weeks early. The killing frost of the 12th in north-central Nebraska; of the 13th generally in Iowa and South Dakota, southeast Michigan, and east-central Colorado; of the 19th in central Nebraska; of the 24th generally in New England; of the 25th in central and northern New York, was about seasonable. The killing frost of the 8th in west-central Minnesota; of the

17th in western lower Michigan, and of the 28th in central Ohio was about one week late; that of the 13th in northeast Wisconsin, of the 20th in east-central Wisconsin, and of the 27th in southeast Wisconsin was about two weeks late, when compared with the average date of first killing frost in the respective regions. A notable feature of the month was a severe cold wave which advanced from the Northwest over the central valleys west of the Mississippi on the 13th, attended by unprecedentedly low temperature and early frost.

The precipitation was generally in excess of the average for September in the Atlantic coast states, from the south Atlantic coast westward to the southeast slope of the Rocky Mountains and the middle Rio Grande valley, and from the middle and south Pacific coasts northwestward to the upper Missouri valley; and the precipitation was deficient from the upper lakes southwestward over the east part of the middle and southern plateau regions, over northeast Florida, along the west Gulf coast, on the north Pacific coast, and over the north part of the northern plateau region. Among the most marked excesses in precipitation noted are: 11.35 inches at Savannah, Ga., 9.55 inches at Key West, Fla., over 5.00 inches at Charlottetown, P. E. I., Albany, N. Y., Charleston, S. C., Augusta, Ga., and Memphis, Tenn., and more than 4.00 inches at New York City. At Brownsville, Tex., the deficiency was 6.86 inches, and it exceeded 4.00 on the coast of Washington. At stations in New York, eastern Virginia, South Carolina, Georgia, southern Florida, Arkansas, central Indiana, Ohio, northwestern Minnesota, central Montana, central Texas, central and southern California, the precipitation was the heaviest, and in northern Texas, Utah, and on the north Pacific coast it was the least ever reported for September. Excessive precipitation injured cotton in parts of North Carolina, South Carolina, Georgia, Alabama, Mississippi, and Arkansas, and damaged corn in southwest Missouri. The rain of the 28-29th caused some injury to raisin grapes in California. The first snow of the season occurred in Montana on the 5th; in central and northwestern Wyoming on the 6th; in North Dakota on the 11th; in South Dakota and northern Minnesota on the 12th; in northern Michigan and Wisconsin on the 13th; and at Tyler's Creek,